

REMARKS

Reconsideration of the present application as amended is respectfully requested.

Claims 28-45 are pending and stand rejected. Claims 28, 30, and 37-39 have been amended. No new matter has been added.

Claim 47 is rejected under 35 U.S.C. §112, first paragraph. The Examiner stated that the specification/drawings do not disclose or describe an uninsulated bond wire touching an outer surface of insulated material of the insulated bond wire. Applicant respectfully disagrees. Applicant respectfully submits that the limitations recited in claim 47 are fully supported by the specification of the present application. Specifically, the specification states:

“As shown in **Fig. 1**, because at least one of a pair of bond wires **11, 12** is insulated, first bond wire **11** and second bond wire **12** can cross at bond wire crossing **13**. The insulating material between the insulated bond wires **11, 12** may prevent current from shorting between one insulated bond wire to the other.”

(Specification, paragraph 14 of page 4, emphasis added)

“As shown in **Fig. 3**, the insulated bond wire **22** may cross other insulated bond wires on the integrated circuit assembly at bond wire crossings **19, 20, 21**. Also, the insulated bond wire may cross other bond wires that do not have insulating material on them. The insulating material on one of two crossing bond wires should prevent a short between them.”

(Specification, paragraph 17 of page 5, emphasis added)

Therefore, applicant respectfully submits that the limitations of claim 47 are fully supported by the specification. Withdrawal of the rejections is respectfully submitted.

Claims 28-31, 34-39, and 42-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,422,435 of Takiar (“Takiar”) in view of WO 98/264,452 to Microbonds (“Microbonds”). Claims 28-29, 31-33, 35-42, and 44-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takiar in view of a document by Tanaka Denshi Kogyo KK, entitled “Insulated Coated Bonding Wire” (“Kogyo”).

Applicant respectfully submits that claims 28-47 include limitations that are not disclosed or suggested by the cited references, individually or in combination. Specifically, independent claim 29 recites as follows:

28. An apparatus comprising:
a first integrated circuit;
a second integrated circuit residing on top of the first integrated circuit;
a first insulated bond wire connecting the first integrated circuit to the second integrated circuit;
a second insulated bond wire connecting the first integrated circuit to the second integrated circuit, an outer surface of a body of at least one of the first and second insulated bond wires contacting an edge of the second integrated circuit without shorting.

(Emphasis added)

Independent claim 28 includes a second integrated circuit stacked on a first integrated circuit and first and second insulated bond wires connecting the first and second integrated circuits, where an outer surface of a body of at least one of the first and second insulated bond wires contacting an edge of the second integrated circuit without shorting. It is respectfully submitted that the above limitations are absent from the cited references, individually or in combination.

As acknowledged by the Examiner, Takiar fails to disclose an insulated bond wire. In addition, Takiar fails to disclose or suggest insulated bond wires connecting multiple integrated circuits in a stack and the insulated bond wires crossing each other. Further, it is respectfully submitted that Takiar fails to disclose or suggest that an outer surface of a body of at least one of the insulated bond wires contacting an edge of the integrated circuit without shorting.

It is respectfully submitted that Microbonds also fails to disclose or suggest the above limitations. Although Microbonds discloses insulated bond wires used in an integrated circuit, Microbonds fails to disclose or suggest such use to be applied to multiple integrated circuits in a stack. In addition, Microbonds also fails to disclose or suggest that an outer surface of a body of

at least one of the insulated bond wires contacting an edge of the integrated circuit without shorting.

Furthermore, it is respectfully submitted that Takiar does not suggest combining with Microbonds and Microbonds does not suggest combining with Takiar. Takiar relates to a process making multiple integrated circuits stacked up together in a cost effective manner comparing to previous methods. Specifically, Takiar states:

“Other attempts at building MCMs have involved placing two or more dice on top of one another and then securing the "stack" of dice in a package. Currently available stacked MCMs are fabricated by stacking entire wafers and then sawing the stacked wafers into stacked dice. Thus, each of the individual die in a particular stack is the same size.

One disadvantage of currently available stacked MCMs is that they are all memory devices; it is believed that no mixed technology devices are currently available in stacked form. Another disadvantage of currently available stacked MCMs is that they require unique and specialized packages. Furthermore, complex and expensive methods are used to make electrical interconnections among the dice; the methods of interconnection currently used are Controlled Collapse Chip Connection (C4) and Tape Automated Bonding (TAB).”

(Takiar, col. 2, lines 47 to 63).

Thus, Takiar is concerned more with the manufacturing process of the stacking integrated circuits, rather than insulation of the bond wires. In fact, none of the bond wires of Takiar cross over each other.

Microbonds relates to insulated bond wires use in an integrated circuit. However, Microbonds uses the insulated bond wires to overcome a traditional bond wiring limitations that only the perimeter of the chip can be bond wired. By using the insulated bond wires, Microbonds can attach the insulated bond wires from the center of the chip. See, for example, page 2 of Microbonds. There is no suggestion of Microbonds that the insulated bond wires can be applied to multiple integrated circuits stacked together.

Because none of the bond wires of Takiar cross over each other and Microbonds does not describe connections between multiple integrated circuits in a stack, there is no motivation to

combine Takiar with Microbonds. Takiar and Microbonds relate to solving significantly different problems and their approaches are significantly different. It is respectfully submitted that those with ordinary skill in the art would not combine Takiar with Microbonds based on the teachings of Takiar and Microbonds, because such a combination lacks a reasonable expectation of success.

Even if Takiar and Microbonds were combined, it is respectfully submitted that such a combination still lacks the limitations set forth above. Further, it is respectfully submitted that Kogyo also fails to disclose or suggest the limitations set forth above. Therefore, for the reasons discussed above, independent claim 28 is patentable over Takiar in view of Microbonds and Kogyo.

Similarly, independent claim 39 includes limitations similar to those recited in claim 28. Thus, for the reasons similar to those discussed above, independent claim 39 is patentable over Takiar in view of Microbonds and Kogyo.

Applicants also respectfully submit that independent claim 45 is not obvious over the references cited by the Examiner. Claim 45 reads as follows:

45. An apparatus comprising:
 - a first integrated circuit;
 - a second integrated circuit residing on top of the first integrated circuit;
 - an insulated bond wire connecting the first integrated circuit to the second integrated circuit;
 - an uninsulated bond wire connecting the first integrated circuit to the second integrated circuit.

Independent claim 45 includes an insulated bond wire and an uninsulated bond wire connecting two integrated circuits stacked up on each other. It is respectfully submitted that the above limitations are absent from the cited references. It is respectfully submitted that none of Takiar, Microbonds, and/or Kogyo discloses or suggests using a combination of insulated bond wires and uninsulated bond wires to connect multiple integrated circuits stacked up together.

As discussed above, there is no suggestion within the cited references to combine Takiar, Microbonds, and Kogyo. Even if they were combined, such a combination would lack the limitations set forth above. Therefore, for the reasons discussed above, independent claim 45 is patentable over Takiar in view of Microbonds and Kogyo.

Given that, claims 29-38, 40-44, and 46-47 depend from one of the above independent claims, for at least the reasons similar to those discussed above, claims 29-38, 40-44, and 46-47 are patentable over Takiar in view of Microbonds and Kogyo. Withdrawal of the rejections is respectfully submitted.


In view of the foregoing, applicant respectfully submits that applicable rejections and objections have been overcome. Applicant reserves all rights with respect to the application of the doctrine of equivalents.

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Respectfully submitted,

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